



CLAIMS

What is claimed is:

1. A process for making an injection molded part being made of different materials comprising the steps of:
 - a) providing a press and a mold with a cavity and core, a parting line, injection nozzles, a moveable inner insert and at least one spacer mechanism that is moveable relative to the core;
 - b) maintaining the parting line of the mold closed until said part is complete;
 - c) setting said spacer mechanism to a first shot position to locate the moveable inner insert to a first shot position;
 - d) closing said mold to a first shot position to set a predetermined shut height;
 - e) applying clamp tonnage to the mold;
 - f) injecting a plastic of at least one type of material to create a first part;
 - g) releasing clamp tonnage;
 - h) opening the press to a predetermined position while maintaining a closed parting line;
 - i) setting said spacer mechanism to a second shot position;
 - j) closing press and applying clamp tonnage;
 - k) Injecting plastic of another type of material to create a second part;
 - and
 - l) opening the press and ejecting the completed part.

2. The process as claimed in claim 1, wherein the inner insert is locatable between first and second positions and other positions to create multiple color or material parts.

3. The process as claimed in claim 1, further comprising the step of controlling a cycle time to enhance bonding of the materials being molded.

4. The process as claimed in claim 1, wherein gas assist is utilized during the process to pack out thick parts.

5. The process as claimed in claim 1, further comprising the step of application of part inserts of metal or film.

6. The process as claimed in claim 1, wherein the completed part has at least two different colors.

7. The process as claimed in claim 1, wherein the completed part has at least two different materials.

8. The process as claimed in claim 1, wherein the first and second parts are joined at an interface.

9. The process as claimed in claim 1, wherein the first and second parts are overlaid.

10. The process as claimed in claim 1, wherein said spacer sets the gap for a first and second shot wall thickness.

11. The process as claimed in claim 1, wherein the process utilizes four spacer mechanisms to move the inner insert to a desired position.

12. A method for making a multi-material injection molded part comprising the steps of:

a) providing a mold with a cavity, parting line, injection nozzles, a moveable inner insert movable relative to a core, and a set of spacer mechanisms for moving the inner insert;

b) injecting a first material into the mold;

c) advancing the spacer mechanisms to set the inner insert to a second shot position while keeping the parting line of the mold closed; and

d) injecting a second material into the mold.

13. The method for making a multi-material injection molded part as claimed in claim 12, wherein the spacer mechanism sets a position the mold can be closed to.

14. The method for making a multi-material injection molded part as claimed in claim 12, further comprising the steps of:

- a) closing the mold to the first shot platen position which adjusts the shut height;
- 5 b) applying tonnage to the mold;
- c) releasing clamp tonnage after creating a first part;
- d) opening platen to a predetermined position while maintaining a closed parting line;
- 10 e) setting spacer mechanisms to a position that results in a relative change of position between the inner insert and the first set part while maintaining a closed parting line;
- f) closing mold to a second shot position;
- g) applying tonnage to the mold;
- h) opening the mold and ejecting a completed part after injecting the second
- 15 material.

15. A process of manufacturing a door panel having at least two different colored panels comprising of the steps of:

- a) providing a mold, injection nozzles, a moveable inner insert and a spacer mechanism that is moveable relative to a core of the mold while maintaining a
- 5 parting line of the mold closed until the process is complete;
- b) setting the spacer mechanism to a first shot position which results in the moveable inner insert being set to a first shot position;
- c) closing the mold to the first shot position;
- d) applying clamp tonnage to the mold;
- 10 e) injecting plastic of at least one type of material to create a first part of the door panel;
- f) releasing the clamp tonnage;
- g) opening mold to a predetermined position while maintaining a closed parting line;
- 15 h) setting the spacer mechanism to a second shot platen position;
- i) closing mold;
- j) reapplying clamp tonnage to the mold;
- k) injecting plastic of another type of material to create subsequent sections of the door panel; and

20 l) opening mold and eject the door panel.

16. The process as claimed in claim 15 wherein the materials have a different durometer rating.

17. The process of claim 15 wherein the materials are of different color.

18. The process of claim 15 wherein the materials are comprised of soft-touch material.

19. A process of manufacturing an injection molded part being made of different materials, comprising the steps of:

- 5 a) providing a mold with a cavity, at least two injection nozzles, a moveable inner insert and a set of spacer mechanisms that is moveable relative to the core while keeping a parting line of the mold closed until the process is completed;
- b) injecting a first portion of a part with the spacer mechanisms located in a first position;
- 10 c) opening press to predetermined position, dumping clamp tonnage, and re-locating the spacer mechanisms to a second position;
- d) maintaining the parting line closed;
- e) injecting a subsequent portion of the part; and
- f) opening mold and ejecting the part from mold.

20. The process as claimed in claim 19, further comprising springs for biasing the core to maintain the parting line closed.

21. The process as claimed in claim 19, wherein means for biasing the core maintains the parting line closed.

22. A process for making an injection molded part comprising the steps of:

- a) providing a mold core and cavity, a mold insert, material to be injected and a press;
- 5 b) moving the insert relative to the core to provide room for injecting a first material;

- c) injecting a first material;
- d) moving the insert relative to the cavity to a second position while maintaining the parting line of the mold closed; and
- e) injecting a second material.

23. The process as claimed in claim 22, wherein the mold remains closed during the process.

24. The process as claimed in claim 22, wherein the step of moving the insert is accomplished by moving an injection press platen.

25. The process as claimed in claim 22, wherein the step of moving the insert is done by the press not by wedges integral to the mold.

26. The process as claimed in claim 22, wherein the mold core stays in contact with the cavity during the molding process to maintain the parting line closed.

27. The process as claimed in claim 22, further comprising springs biasing a core for maintaining the parting line shut during the process.

28. The process as claimed in claim 22, further comprising the step of shifting the insert to another position and molding additional materials.

29. A mold for making a plastic part made from multiple materials comprising:

- a pair of clamp plates;
- a core block positioned adjacent to one of the clamp plates;
- a moving spacer mechanism retainer plate for holding spacers in place;
- a cavity block positioned adjacent the core block;

- an inner-insert mechanism assembly positioned within the core block, the inner- insert including retainer pins, retainer slides and slide holders;
- a spacer mechanism for setting the inner-insert mechanism;
- 10 at least one hydraulic cylinder for moving the spacer mechanism;
- a set of parallel members located on an upper side of the cavity block;
- a manifold retainer plate located adjacent the parallel members;
- an ejector retainer plate and an ejector plate located on an underside of the manifold retainer plate;
- 15 a first shot manifold assembly disposed within the manifold plate;
- a second shot manifold assembly disposed within the manifold plate; and
- ejector cylinders fixed to the manifold retainer plate.